

INDEX

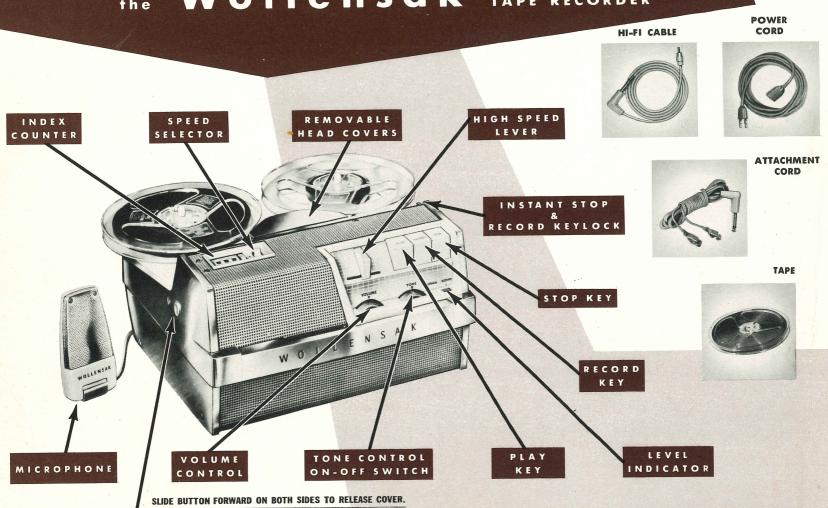
5.	TO MAKE A MICROPHONE RECORDING
6.	TO PLAY BACK RECORDINGS
7.	RECORDING TECHNIQUES
8.	TIPS ON RECORDING WITH MICROPHONE
9.	ADDITIONAL FEATURES
10.	CONNECTING TO HI-FI SYSTEMS
11.	WOLLENSAK ACCESSORIES

FOREWORD

Your Wollensak recorder is manufactured with the precision that has made Wollensak famous in the fine lens and camera field. Exceptional quality is evident in every detail of design and construction. True console performance is now achieved in a lighter weight, more portable unit by incorporating the latest miniature components and rugged all metal air-plane type construction. Simplified key-board controls enable making recordings at a touch of the finger, that are comparable with those made on the finest precision broadcast equipment.

Now you can make priceless recordings of big events in your life — children's voices, family reunions, your favorite symphonies — these sounds can be preserved forever or if desired, the tape can be erased and used over and over, endlessly.

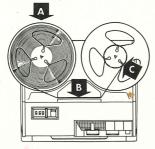
introducing ... Wollensak TAPE RECORDER



TO MAKE A MICROPHONE RECORDING

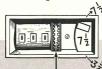
1. CONNECT POWER CORD to an electric outlet and power socket in rear of machine.

Rewind lever must be in center position, turn on power by turning tone control knob.





- (A) Press stop key place full reel on the left spindle. (Glossy side out, type "A" wind tape.)
- (B) Stretch tape in line with threading slot, and lower it into place.
- (C) Attach end of tape to take-up reel.



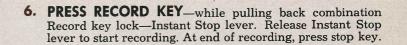
3. SET INDEX COUNTER to ZERO by turning back its knurled knob. This enables you to return to the exact beginning of the recording.



4. INSERT MICROPHONE PLUG firmly into Microphone Input Jack, located in rear of recorder. Switch must be in Record Mike position as shown.



5. SET RECORD LEVEL—Turn tone control to Treble. While talking into microphone, adjust Volume Control until the "Normal" half of the indicator flashes and no flashing occurs at the "Distorted" half.



TO PLAY BACK RECORDINGS

1. **REWIND TAPE**—by moving High Speed Lever to the left. Return lever to center position to stop tape when index counter reads Zero.



2. PRESS PLAY KEY—and adjust Volume and Tone Control to suit.

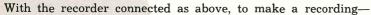
RECORDING FROM RADIO, T.V., PHONOGRAPH

TO CONNECT RADIO OR T.V.

Insert attachment cord into microphone-radio-phono jack, in rear of recorder. Connect the clip ends of cord to radio or T.V. speaker terminals. Push switch to "P.A.-Monitor".

TO CONNECT PHONOGRAPH

Any crystal or high level magnetic phonograph having a standard phone plug can be connected directly into the Microphone-Radio-Phono Jack, in rear of recorder. Otherwise the attachment cord may be used. Push switch to "P.A.-Monitor."



Set Recording Level—While playing Phono, hold Instant Stop lever and press Record Key. The speaker will be muted so that the monitored program will be heard at a comfortable volume. Adjust Volume control until "Normal" half of indicator flashes and no flashing occurs at the "Distorted" half.

Set Index Counter—to zero or note the present reading, so you can return to the exact location of your recording. Pull back combination Instant Stop—Record Key Lock.

Release Instant Stop Lever to Begin Recording.

If desired, the recordings can be made in silence by switching the Speaker switch to "Record Mike."



TWIN TRACK RECORDING

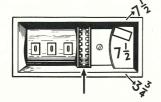
Your Wollensak Model 1500 is a twin track recorder. This means that each reel holds two full length recordings, one on each half of the dull side of the tape. Rewinding is not necessary at the end of the first track. To use the other track, simply take the full reel from the right spindle, turn it over, place it on the left spindle and re-thread machine.

RAPID FORWARD

To skip ahead to any point on the tape, move the high-speed lever to the right. To stop, return the lever to Neutral. By moving the lever back and forth, the tape can be inched along to an exact point. The lever can be moved while the recorder is in any function (Play, Record, or Stop) and movement of the lever will automatically release the Play or Record keys.

USE OF TAPE COUNTER

Set Counter to Zero at the beginning of the reel by turning back its knurled knob. As you record a selection, mark the title and index number on the back of your tape box. This will enable you to locate selections instantly in the future.



SPLICING AND EDITING

If only one track is recorded, the tape may be edited by cutting out unwanted portions or by joining selections in another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

For best results, cut tape at a slight diagonal, join ends together with Scotch Splicing tape on the glossy side. Trim off any excess width.

For very precise editing, press "Play key and push in Instant Stop Lever. Turn reels by hand to locate the word or sound.

The tape is then cut or marked at this sound by pulling off the head covers and marking the tape at the right hand element in the black slot of the sound head. (The left element is the erase section.) The tape is most easily removed from the threading slot by stretching the tape toward you against the front Head cover and lifting up.

RE-USING TAPE

Simply record the new program over the old material. The old recording will be automatically erased in the process. The rerecording process can be repeated indefinitely without deterioration in quality — a feature of Wollensak automatic High Frequency erase.

Only the portion of tape passing the Sound Head is erased when recording; this enables individual words or phrases to be inserted into an existing recording. Unwanted portions can be erased without recording new sound by turning the Volume control down while recording.

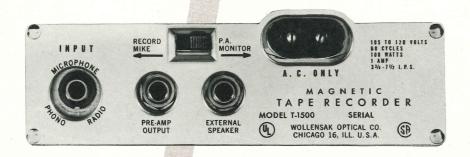
RECORDING TECHNIQUES

In recording, the most satisfactory results are obtained when the microphone is held about one foot from the mouth. Do not place the microphone on the same table with the recorder, or on a piano, or radio, as the microphone may pick up vibrations and produce a noisy recording. Try to keep the microphone at least three feet from walls during recording. When recording a group meeting or party, place the microphone in the center of the group. Wrapping the microphone in a few folds of soft cloth will help to reduce background noise. Microphone extension cord assembly A196-2 lengthens cable an additional 15 feet.

Microphone recordings can be monitored by plugging a headset into the External Speaker Jack, at rear of recorder, and pushing speaker switch to P.A.-Monitor. Monitoring with the recorder's speaker can be accomplished by pushing the speaker switch to P.A.-Monitor, however, the speaker and microphone should be separated as far as possible. For best results, the microphone and speaker should be placed in separate rooms. If the precaution of isolating the speaker and mike is not taken, feedback and howling will occur as with all high gain amplifiers.

COPYING A TAPE OF ANOTHER RECORDER

Connect two A196-12 attachment cords together so that the clips with the knotted wires (Ground) are on the same side. Plug into the output socket (Pre-Amp. or External speaker) of the recorder being played and into the Input socket (Phono-Radio) of the second recorder. Play the tape with the Tone Control midway between Treble and Bass and set the volume on both recorders to flash the Normal Indicator on each machine.



BALANCED TONE CONTROL (Patented)

The tone control is designed to give four distinct tonal extremes, and can be varied continuously between them to produce a blend of tone suitable to any type of program.

In BALANCED TONE Position, the response of the amplifier and acoustic system are coordinated to emphasize the very low and very high tones. The degree of emphasis varies with the volume setting, since less emphasis is required at high volume. The result is a striking realistic sound reproduction since the characteristics of the ear are compensated.

In BASS position, the highs are cut off and the very low tones are emphasized, resulting in a deep, rich tone. This position will also decrease the noise and scratch obtained from recording the sound from poor disc records.

TREBLE position brings forth the high overtones that give identity to musical instruments and clarity to speech.

HI-FI position is the setting which produces the widest uniform response for connection of the recorder to auxiliary equipment. The Tone Control is disconnected while recording. With the tone control in Treble prior to recording, the Record Level may be accurately pre-set.

TWO LEVEL RECORD INDICATOR

This indicator takes the guess work out of setting the recording level. The lamp is arranged so that "Normal" side (left "D" shaped element) lights at a lower volume than the "Distorted". For correct recording level setting, adjust the volume until the "Distorted" indicator just extinguishes on loud passages and the "Normal" still flashes. The markings of "Normal" and "Distorted" apply only to recording. In playback, the indicator only shows relative volume.

AUTOMATIC HEAD DEMAGNETIZING

Recordings are protected against accumulating DC noise which could otherwise spoil even pre-recorded tapes being played. The demagnetizing circuit operates after each recording when the Record Key is released.

PUBLIC ADDRESS SYSTEM

With the recorder in Stop, pushing the Speaker Switch in the rear of the recorder to P.A.-Monitor connects the amplifier to the microphone as a 10 watt public address system. For best results, external auditorium speakers should be used and microphone and speakers separated as far as possible to prevent feedback and howling.

The excellent built-in 10 watt negative feedback amplifier will deliver sufficient power to fill auditorium of 300 to 500 people. The amplifier with its extended range to 20,000 cycles is also suitable for direct connection to a Radio, AM-FM tuner or phonograph. The Tone control is fully effective in Stop and Play.

EXTENSION SPEAKER JACK

Superb reproduction can be obtained by operating a large Hi-Fi speaker directly from the External Speaker Jack. The Attachment Cord supplied may be used for this purpose. Nominal output impedance is 8 ohms. Speakers with impedances of 3.2 or 16 ohms may be used with only a slight loss in power. Frequency response is unaffected. Accessories such as the TE-401 ear phone or any head phones may be used. The speaker in the recorder is disconnected when a plug is inserted into the External Speaker Jack.

DUAL HI-LO INPUT

The single Input Jack, located on the rear panel is designed to make the proper selection between Microphone and Phono-Radio. Microphone connection (10 meg-ohm) is made with the shorter (1") plug as furnished with the Mike, and Radio-Phono connection is made with a standard phone plug 1-3/16" as furnished on the Attachment cord.

ADDITIONAL FEATURES

CONNECTING TO HI-FI SYSTEMS

A Pre-Amp output is provided for direct connection to Hi-Fi systems. To connect for playing a tape, connect a shielded cable such as Revere A196-13 Hi-Fi cable from the Pre-Amp output on the back of the recorder, to the External Amplifier's socket marked "Auxiliary", "T.V.", "Tuner", or "IV input". For playing tape, set the recorder's tone control to "Hi-Fi" and adjust the volume until the Normal indicator flashes. Thereafter, adjust volume and tone on the external amplifier to suit. When operated as above, the recorder will provide the maximum performance. To silence built-in speakers, plug A 196-12 cord into Extension Speaker Jack. If no connection is made to the recorder input, a slight hum may be introduced when the stop key is pressed. To eliminate this insert any standard phone plug into the input. To connect for recording, plug a A196-13 Hi-Fi cable into the recorder's Radio Phono Input Jack (located in the rear) and to the socket of the external amplifier marked, "Detector", "Tape", "Recorder Input", or "Pre-Amp Output". If desired, recordings can be made directly from the AM-FM tuners by connecting the Hi-Fi cable from the tuner socket to the recorder's Input Jack. The recorder can be used as audio amplifier by pressing Stop key and pushing the Speaker switch to "P.A.-Monitor".

MANUAL INSTANT-STOP LEVER

To the rear of the Stop key, is a combination Manual Start-Stop Lever-Record Key Lock. The Record key cannot be pressed unless the instant stop lever is pulled. This prevents accidental erasure of tape. While in Record or Play, pulling the lever instantly stops the tape. Examples of its use are: to noiselessly hold back the tape to prevent recording unwanted breaks in radio programs; to precisely set the recording level while the Record key is down.

SIMPLER THREADING

With the "Stop" key down, the tape reel spindles are automatically locked. By placing a full reel of tape on the left spindle and pulling off a small length of tape, the reel will fall into place. A single wrap of tape around the take up reel is enough to engage the tape when the reel is set in motion by pressing Record or Play key.

SPEED SELECTOR

A convenient speed selector is provided on the front panel adjacent the tape counter. Selector is pushed up for $7\frac{1}{2}$ inches per second speed. Speed selector can be pushed while the recorder is in any function. Rapid Forward winding can be accelerated by pushing selector to $7\frac{1}{2}$ ips. For most recordings of speech and music, the $3\frac{3}{4}$ speed will give excellent results. The $7\frac{1}{2}$ speed is intended for use when the recorder is used in conjunction with Hi-Fi systems.

MICROPHONE

The furnished unit is one of the latest wide range ceramic type that is unaffected by climatic conditions. The built in swivel base accepts any \(^{5}_{8}"-#27\) thread, desk or floor stand.

AUTOMATIC RELEASE FOR STORAGE

When the power ON-OFF switch (on Tone Control) is turned off, the Record or Play key is automatically released, thereby disengaging pressure pads and rubber rollers for safe storage of the instrument.

MAINTENANCE

If sound becomes unsatisfactory, or ability to erase is impaired, clean Sound Head. Pull up the Head Covers and wipe the black face of the Sound Head with a little alcohol on a cotton swab. While in "Play", note if the two felt pads are worn or not pressing tape squarely against pole faces. Replacement felt pressure pads furnished may be cemented in place with household cement. Pads should cover shiny pole faces of Head, and side of pad touching Head should be free of cement.

All moving parts are permanently lubricated. Under normal use, further lubrication should not be required.

The electrical parts are generously rated and replacement should not be necessary. To replace tubes, simply remove bottom cover by removing its 8-screws; 4-screws in line with and inside front feet; 2-screws on side panels ½" above rear feet; 2-screws 1" to the side of rear cover hinge.

HUM CONTROLS—Remove bottom cover and note locations on inside label. Without tape, press Play key and turn volume to O. Set 1st control with a small screwdriver to minimize hum. Next turn the volume to 10 and adjust 2nd control through the chassis hole indicated.



STUDIO MICROPHONE

For critical requirements of professional users. Dynamic Type wide response (40-15,000 cps.) Super-Cardiold excludes side and back noises. With desk stand and 25 foot cord.

A-162-2

\$75.00



CASE SLIP-OVER TYPE

Genuine virgin vinvl with handy storage pocket for reels, cords and accessories. Folds flat when not in use.

TSC-405

\$7,50



STEREOPHONIC KIT IN-LINE

Converts Model T-1500 Wollensak recorder to stereo playback and monaural recording. Kit includes IN-LINE head, insulators, wrench, cable and instructions.

SK-707

\$34.50

SPECIFICATIONS

Size:

61/2" x 101/4" x 113/4" (approximately)

Weight:

18 lbs.

Power Consumed: 100 Watts

Playing Time: 3 hours L.P. tape (33/4 ips.

7" reel)

11/2 hours L.P. tape (7½ ips. 7" reel)

1/3 less time with regular

Frequency Response:

 $40 - 15{,}000$ cps. ± 3 db. at $7\frac{1}{2}$ ips. 40 - 8,000 cps. ± 3 db. at $3\frac{3}{4}$ ips.

Both Speeds

WOW - Flutter — less than 0.3% Signal to noise ratio — greater than 48 db.

WOLLENSAK ACCESSORIES



HI-FI CABLE

Specifically designed for connecting recorder to HI-FI amplifiers and AM-FM tuners, 4-foot shielded cord with Wollensak plug and phono pin plug.

A196-13 \$2.00



MICROPHONE EXTENSION CORD

For making microphone recordings at a remote location. 15 Ft. length with Wollensak plug and cable jack.

A196-2

\$7.50



FOOT CONTROL

Starts and stops tape instantly in either "Record" or "Play" without manual operation.

TF-404 \$17.50



EXTRA ATTACHMENT CORD

For connecting Radio, T.V., Phonograph, or External Speakers to recorder.

A196-12

\$2.50



MIXER

Three Inputs -Permits mixing of any combination of three microphones, phonos, or radios.

TF-908

\$15.00



EAR PHONE

For private playbacks . . . Ideal for stenographers, etc. Reversible to fit either ear. Low impedance.

TE-401

\$10.50



A SUBSIDIARY OF MINNESOTA MINING AND MANUFACTURING COMPANY

WOLLENSAK T-1515-4 HI-FIDELITY 2 & 4 TRACK STEREOPHONIC TAPE RECORDER

INSTRUCTIONS

FOREWORD:

Your Wollensak Stereophonic Tape Recorder enables making monaural single track recordings in the manner described on the first six pages of this instruction book. In addition, this stereo recorder has a built-in second channel head and preamplifier that provides for playing back pre-recorded 2 or 4 track stereophonic tape.

With this unit, you can enjoy the realism of music never before obtained. A full orchestra will be reproduced right in your living room. You can sit back and feel the impact of percussion instruments on one side of the room contrasted with soft sounds of string or wood instruments on the other.

In a similar manner that stereo photography uses two pictures, one for each eye, to bring out the realism and depth of three dimensions, Wollensak T-1515-4 uses two separate sound channels to bring you the magnificent depth of three-dimensional sound.

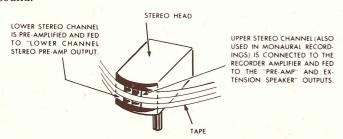


FIGURE 1. DUAL CHANNEL STEREO HEAD

Figure 1. below shows how the tape has two sound tracks. To see the head on your machine, remove the head covers, as described in maintenance section.

4-track stereo means there are two stereo channels in each direction on the tape. After playing the tape in one direction, the tape may be turned over, without rewinding, and played in the other direction. 4-track stereo doubles the playing time per roll of tape.

Because of the greater fidelity and versatility of stereo on magnetic tape, most recording companies are now using this medium to record their first music masters. This provides for an endless supply of superb Hi-Fi tapes which are readily available at most music stores.

Your Wollensak T-1515-4 head dial system provides a further exclusive feature of being able to record and play 4 - separate, monaural tracks on a single width of tape. The ability to record 4 - monaural tracks can provide up to four times more playing time per roll of tape, thus resulting in 4 to 1 saving in tape costs.

PLAYING STEREO RECORDINGS THROUGH RADIO, T.V. OR PHONO:

The upper stereo channel is played as a regular recording through the tape recorder and its self-contained speaker, as described on page 6 of the instruction book. The lower stereo channel of the recorder has a built-in pre-amplifier, which enables playing through most radios, T.V.'s, tape recorders, or phonos.

TO MAKE CONNECTIONS:

Make connections as shown in figure 2. below:

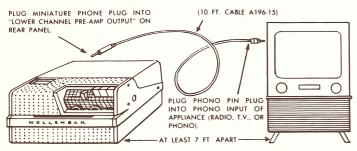


FIGURE 2. TYPICAL STEREO HOOK UP

Place switch on appliance (radio, T.V., or phono) in "phono" position. Place recorder and appliance on one side of the room at least 7 feet apart. Play a stereo tape and adjust the volume of both units so that they sound equal when standing equidistant between them.

Hum may develop on the lower channel with certain brands of appliances (radios, T.V.'s, or phonos), in particular the units that are marked AC-DC. To lower the hum, try reversing the power plug of either or both the recorder and the appliance. If the appliance has an exposed chassis, try connecting a wire between the recorder and appliance chassis. Do not attempt to make a connection to an unexposed AC-DC radio chassis for this may create a shock hazard. In severe cases of hum, an inexpensive isolation transformer for the appliance may have to be used to isolate the appliance from the power line.

CONNECTING STEREO RECORDERS TO HI-FI SYSTEMS:

There are a large number of hook ups that can be made between the recorder and Hi-Fi units. The most common hook up is shown in figure 3.

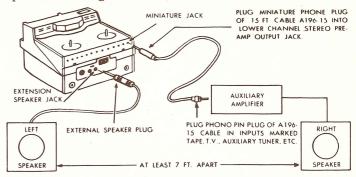


FIGURE 3. TYPICAL STEREO HOOK UP WITH HI-FI EQUIPMENT

With the equipment hooked up as in figure 3., play a stereo tape and adjust both units so that they sound equal when standing equidistant between the two speakers.

If desired, another auxiliary Hi-Fi amplifier can be used to drive the left speaker. To connect the upper channel or left amplifier, follow the instructions on "Connecting To Hi-Fi Systems" on page 10.

If there is hum in the lower channel, try routing the A196-15 cable away from the hum sources, such as power transformers or line cords. Try also reversing the power plug of either the auxiliary amplifier or the recorder.

The lower channel pre-amp hum adjustment has been factory adjusted for minimum hum; however, in some cases of excessive hum, a readjustment may be necessary. To accomplish this, have the recorder turned on and in "Stop" position. Turn up the volume on the lower channel auxiliary amplifier and adjust the pre-amp hum adjustment for minimum hum. The pre-amp hum adjustment is accessible by removing the bottom tube replacement cover.

SPEAKERS AND REPLACEMENT:

For the best reproduction, the speakers should be of good quality, Hi-Fidelity units. Place the speakers on one wall at least 7 feet apart. Locate them so that the listening area is on a central line between the two speakers. If the room is not too large, the speakers can be placed in opposite corners facing the center of the room. The speaker in the recorder can be used as one of the speakers by placing the recorder in one position and the speaker connected to the auxiliary amplifier in the other.

The most realistic binaural effect can be obtained by the use of head phones. Wire the head phones so that the recorder output feeds a phone to one ear and the other phone is fed from the auxiliary amplifier.

TRACK SELECTION

WOLLENSAK T-1515-4:

• Records and Plays Monaural 2 (or twin) track.

 Records and Plays Monaural 4-separate tracks providing up to four hours on 1200' reel.

• Plays Stereo 2-track tapes.

Plays Stereo 4-track tapes.

TO RECORD OR PLAY MONAURAL 2 TRACK

1. Rotate the head track selector in back of head cover to 2 track.



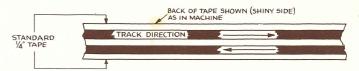
Monaural 2-track means that each reel holds two full length recordings, one on each half of the dull side of the tape. Rewinding is not necessary at the end of the first track. To use the other track, simply take the full reel from the right spindle, turn it over, place it on the left spindle and re-thread machine.

MAKING TAPES TO PLAY ON 2 TRACK MACHINES:

In exchanging tapes with people that have 2 (or twin) track machines, be sure your track selector is set on 2 track. The T-1515-4 erases only ¼ of the tape, for this reason either new

tape will have to be used on your machine or the tapes will have to be bulk erased first. Such bulk erasers are available through most larger radio parts supply houses.

Another method is to record with the volume control turned all the way down on all four parts as described in Record 4 track in the following. This will erase the four tracks, then set the track selector to 2 track and record in the normal manner.



LOCATION OF 2-TRACK RECORDINGS ON THE TAPE

TO RECORD OR PLAY 4 SEPARATE MONAURAL TRACKS.

- Part 1. (Track No. 1) Place track selector on "A". Place both full and empty reels on Recorder with side No. 1 up. Record or play side No. 1 of reel.
- Part 2. At end of reel, take the full reel from the right spindle, turn it over to side No. 2, place it on the left spindle and re-thread machine. Place empty reel with side No. 2 up.
- Part 3. At end of reel, turn track selector to "B," take the full reel from the right spindle, turn it over to side No. 1, place it on the left spindle and re-thread machine. Place empty reel with side No. 1 up.
- Part 4. At end of reel, take the full reel from the right spindle, turn it over to side No. 2, place it on the left spindle and re-thread machine. Place empty reel with side No. 2 up.

A simplified chart of the above procedure, located in the case cover, is as follows:

FOUR	FOUR MONAURAL TRACKS		
	BOTH REELS	SELECTOR	
PART 1	SIDE: 1	ON: A	
PART 2	SIDE: 2	ON: A	
PART 3	SIDE: 1	ON: B	
PART 4	SIDE: 2	ON: B	



LOCATION OF 4-TRACK RECORDINGS ON THE TAPE

ELECTRICAL SPECIFICATIONS OF THE WOLLENSAK T-1515-4:

HEAD: In-line stacked 4-track head with balanced hum buck ing construction

FREQUENCY RESPONSE:

UPPER CHANNEL: 30-20,000 C.P.S. \pm 3db @ $7\frac{1}{2}$ I.P.S

(NARTB Standard Equalization) 30-15,000 C.P.S. ± 3db @ 3¾ I.P.S.

(Recording & Playback)

LOWER CHANNEL: 30-20,000 C.P.S. ± 3db @ 7½ I.P.S

(NARTB Standard Equalization)

(Playback Only)

WOW & FLUTTER less than 0.3%

SIGNAL TO NOISE RATIO: Greater than 50db

SIGNAL FROM LOWER CHANNEL PRE-AMP OUTPUT: 0.5-1.5 volts

CROSS TALK: Less than 50db